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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Bradley Dale Mitchell

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7590

08/26/2004

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EXAMINER

ROGERS, DAVID A

ART UNIT

PAPER NUMBER

2856

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/903,119	Applicant(s) MITCHELL, BRADLEY DALE	
	Examiner David A. Rogers	Art Unit 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9, 14, 23, 28, 35, 40, 45 and 50 is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-13, 15-22, 24-27, 29-34, 36-39, 41-44 and 46-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>20040419</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. The examiner for this application has been changed. Please address all correspondence to the examiner named below. The USPTO is in the process of moving to new office spaces in Alexandria, Virginia. Please note the new phone numbers for the examiner and the examiner's supervisor below.

***Response to Arguments***

2. The applicant's arguments filed 19 April 2004 have been carefully considered, along with the previously cited prior art. The arguments are persuasive with regard to the applicability of some references. However, the arguments are considered moot in view of the new ground(s) of rejection noted below.

The indicated allowability of claims 10, 24, 36, and 46 is withdrawn in view of the newly discovered reference(s). Rejections based on the newly cited reference(s) follow.

The Office apologizes for any inconvenience that this might cause the applicant.

***Specification***

3. In response to the applicant's suggestion a substitute specification would be preferred due to the extensive changes made. Please note that a substitute specification must not contain new matter. The substitute specification must be submitted with markings showing all the changes relative to the immediate prior version of the specification of record. The text of any added subject

matter must be shown by underlining the added text. The text of any deleted matter must be shown by strike-through except that double brackets placed before and after the deleted characters may be used to show deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived. An accompanying clean version (without markings) and a statement that the substitute specification contains no new matter must also be supplied. Numbering the paragraphs of the specification of record is not considered a change that must be shown.

### ***Drawings***

4. The drawings were received on 19 April 2004. These drawings are acceptable.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 5-8, 10, 11, 15, 19-22, 24, 25, 29, 32-34, 36, 37, and 46 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over United States Patent 6,165,272 to Liu.

Liu discloses a semiconductor wafer production chamber (reference item 18), as seen in figure 2. The chamber is couple to a source of gas ( $N_2$ ) via a conduit (reference item 22). The chamber is also connected to an exhaust vent (reference item 70) via a vacuum conduit (reference items 62 and 64). The exhaust vent is comprised of two wider conduit sections (reference items 72 and 74), a narrower conduit section (reference item 78), and a butterfly valve (reference item 80).

Liu further discloses that deposits can form on the conduit walls during use of the chamber and must be detected. In order to perform the detection, the butterfly valve is positioned vertically ( $0^\circ$ ) in its conduit. The pump speed of the fluid (gas ( $N_2$ )) flow rate is continuously monitored. When a blockage occurs the monitored pump speed or the flow rate will be lower. In response to the monitored signal the butterfly valve will be reoriented to a larger angle (a change in operational status), such as seen in figure 5. This is done in order to increase the pump speed or the flow rate back to a predetermined level.

Notes: The butterfly valve shown in figure 1 is not located in the correct position. It should be located in the conduit 72, as seen in figures 3 and 5. Also, if the flow rate is maintained at a predetermined value then the pump speed must be increased due to the blockage. Conversely, if the pump speed is maintained at a predetermined level then the flow rate must increase due to the blockage. Flow rates are typically given in the units of, for example, standard cubic feet per minute (SCFM), which is a flow rate based on volume.

Finally, it is well known to use programmable circuits, e.g. EPROM, EEPROM, in order to ensure that operating parameters can be easily adjusted. This would be preferred in the case of Liu as it is disclosed that the alarm can be issued at a preferred angle of the butterfly valve, and that the preferred angle can be changed.

At some point the angle of the butterfly valve will be such that an alarm is provided to shut down the processing chamber due to a large blockage (another change in operational status). The change in butterfly valve position will be inherently associated with either a change in pump speed or gas flow rate. One could easily choose to monitor either or both the pump speed and the flow rate in addition to the butterfly valve's position since that these parameters are already being monitored in the device of Liu.

7. Claims 2-4, 16-18, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu as applied to claims 1, 15, and 29 above, and further in view of United States Patent 6,240,775 to Uramachi *et al.*

Liu teaches the monitoring the flow rate of a conduit to determine a blockage. In particular, the conduit is comprised of two larger-diameter sections (reference items 72 and 74) with a narrower-diameter section (reference item 78) in between, as seen in figures 1, 3, and 5.

Uramachi *et al.* teaches a flow rate sensor in a conduit, the conduit being formed of two wider-diameter sections with a narrower-diameter section in between. The flow rate sensor (reference item 22), as seen in figure 35,

comprises a substrate with resistance elements (reference items 11 and 13). The flow rate detecting element (reference item 11) is powered in order to heat the fluid flowing past to a level higher than the fluid temperature detected by the other compensating element (reference item 13). By monitoring the power needed to heat the detecting element one can determine the flow rate of the fluid. As taught by Uramachi *et al.* the preferred flow rate sensor allow the correct detecting of the flow rate even if there is a change in the flow speed distribution upstream (column 3, lines 59-65) such as due to flow blockage in the conduit (column 2, lines 30-36).

It would have been obvious to one of ordinary skill in the art to modify the teachings of Liu with the teachings of Uramachi *et al.* in order to obtain or use a flow rate sensor comprising heating elements to aid in the detection of a blockage in a conduit.

8. Claims 12, 13, 26, 27, 38, and 39 rejected under 35 U.S.C. 103(a) as being unpatentable over Liu as applied to claims 1, 6, 15, 20, 29, and 33 above, and further in view of United States Patent 6,402,954 to O'Keefe, Jr.

Liu teaches the monitoring of the flow rate of a gas. Liu, however, does not teach the monitoring of the rate of change of the flow rate of the gas.

Monitoring the rate of change of the flow rate is known. See O'Keefe, Jr. where the flow rate change of a fluid is monitored. Doing so in the case of Liu would allow one to determine if a sudden blockage of the vacuum conduit occurs that would result in the pump speed increasing beyond a safe limit for

the chamber. Monitoring the rate of change of the gas would also allow the device of Liu to determine when the blockage has been cleared using the gas.

It would have been obvious to one of ordinary skill in the art to modify the teachings of Liu with the teachings of O'Keefe, Jr. in order to obtain or use a flow rate sensor and monitoring the rate of change of the flow rate.

9. Claims 41-44 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Uramachi *et al.*

Claims 41-44 and 47 are rejected for the reasons set forth above in paragraphs 6 and 7. For brevity in this action, the rejection will not be restated.

10. Claims 48 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Uramachi *et al.*, as applied to claims 41 and 42 above, and further in view of O'Keefe, Jr.

Claims 48 and 49 are rejected for the reasons set forth above in paragraph 8. For brevity in this action, the rejection will not be restated.

#### ***Allowable Subject Matter***

11. Claims 9, 14, 23, 28, 35, 40, 45, and 50 are allowed.

#### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Rogers whose telephone number is (571) 272-2205. The examiner can normally be reached on Monday - Friday (0730 - 1600).



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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19 August 2004

  
HEZRON WILLIAMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800